# FAA AVIATION NEWS

DECEMBER 1972

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**COVER:**
Peace on earth,
and in heaven above.
*Photo by Donald E. Saunders, Lebanon*

# FAA AVIATION NEWS

**DEPARTMENT OF TRANSPORTATION / FEDERAL AVIATION ADMINISTRATION VOL. 11, NO. 8**

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# FROST on the WING

## Hangaring an airplane overnight will not always protect you from snow and ice problems on takeoff

Wintry weather played a dual role in this crash. Icy surface failed to provide traction for gear-up emergency landing, after takeoff was aborted when snow, which did *not* blow off the wings, hampered lift. Plane slid off runway, crashed into approach light poles and burned, killing three.
(Photo courtesy Binghamton N.Y. Press)

At 3:40 p.m. the Beech C-45H was wheeled out of the heated hangar and taxied to the loading ramp, where nine passengers and the two-man crew were boarded. The flight, Commuter Airlines 502, was cleared for takeoff by the Binghamton (N.Y.) control tower at 4:11, and the controller subsequently directed the pilot to contact departure control. A few minutes later the aircraft was a flaming wreck on the ground beyond the runway, three persons dead, all others injured.

How did it happen?

The investigation disclosed no evidence of mechanical failure. The crew was fully qualified, the aircraft properly loaded and fueled. Aids to navigation were not involved and there were no communication problems.

The weather on this March day in upstate New York was a matter for some consideration. The ceiling at Broome County Airport was 300 feet, the sky obscured, visibility one-half mile variable in moderate snow. The temperature was 34 degrees F., *dewpoint* 33 *degrees* F. A good day to stay home, if you have no pressing business elsewhere, but the twin Beech was fully qualified and equipped to take off in these conditions. And Commuter Airlines was a *scheduled* air taxi.

The takeoff was performed by the captain, a seasoned ATR pilot with more than 6,600 logged hours. The takeoff run was described by observers as "longer than usual", due to snow and slush on the runway. Following lift-off and at an estimated altitude of between 75 and 100 feet, the left wing dropped down in a moderately steep bank. The captain was able to raise the wing with aileron control, but the aircraft lost altitude as it "mushed" from side to side before levelling off at approximately 10 to 20 feet above the runway. The landing gear was retracted and the aircraft again began to climb.

At an altitude of between 75 to 100 feet the left wing again dropped off into an estimated 45° to 60° bank. Again the aircraft mushed back and forth before levelling out about 20 feet above the runway. At this point the captain retarded the throttles and made a smooth wheels-up landing on the runway. The twin Beech skidded past the dirt overrun, over the embankment and crashed into the approach light structures.

Fire broke out in the right wing, and spread almost immediately into the cabin, as the survivors fled through the main door and a break in the cabin structure. The captain and two passengers perished.

The National Transportation Safety Board eventually determined that the probable cause of this accident was *the attempt of the pilot-in-command to take off with snow adhering to the airfoil surfaces . . . (causing) a degradation of aircraft performance and loss of control following lift-off. . . .*

The weight, shape and texture of the snow adhering to the ill-fated aircraft's wing could not be exactly determined, but several witnesses, including the surviving co-pilot, reported seeing a layer of snow on the wing when boarding the aircraft. The co-pilot stated that he assumed the snow would blow off during the taxi or takeoff roll. Apparently the captain made the same tragic assumption.

The captain was also ascribed the responsibility for not having ordered the application of glycol anti-icing spray to the aircraft prior to departure, although the equipment was available in the hangar, according to Commuter officials.

From the behavior of the aircraft in flight it has been inferred that the aerodynamic lift of the wing was degraded by the presence of snow, which did not blow away except in small patches behind the engines. It has been conjectured that the falling snow may have melted as it encountered the wing (immediately following the aircraft's removal from the heated hangar) and subsequently solidified as the wing assumed the near-freezing ambient air temperature, to the point where it adhered firmly to the upper wing surface. Various studies have confirmed that the adherence of even a light layer of ice or frost on the wing will result in higher stall speeds and lower stall angles of attack.

Because of its rough texture, even a slight layer of solidified melted snow could be even more detrimental than a buildup of ice. In discussing the effects of surface roughness, a U.S. Navy publication for Navy aviators explains that,

"While the basic shape and aerodynamic contour is unchanged, the increase in surface roughness increases skin friction and reduces the kinetic energy of the boundary layer . . . (which) will cause incipient stalling of the wing. . . "

The behavior of the twin Beech in flight also points the finger of suspicion at weakened lift characteristics. The aircraft apparently was able to take off and remain airborne *within the increased lift area of ground effect,* but unable to climb or maintain flight above this area.

The captain's records show that he was familiar with cold weather flying both as a pilot with Commuter, where cold weather operations are common, and through his experience as a pilot with the Navy based in Minneapolis. His fatal mistake should serve as a warning to veterans and neophytes alike, that the old devil Frost is still very much to be reckoned with.

Only fly with clean wings. ■

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# The Twelve Days of Christmas 1971

*When a single-engine airplane, supported by Wings of Hope, solved an Amazon mystery.*

In the town of Pucallpa, Peru, near the eastern slope of the rugged Andes, an elaborate shrine stands out against the steamy green-black rain forest. The local people come regularly to fill the many niches of the shrine with fresh flowers. On the very top a white tablet, surrounded by marble angels, bears a map of the immediate area and a pair of gold wings with the legend "Alas de Esperanza" ("Wings of Hope").

The shrine serves a dual purpose: it commemorates the 52 Pucallpa area residents among the 92 persons who lost their lives in an airplane crash on Christmas eve, 1971, and it pays tribute to the small airplane, operated by a humanitarian group called *Wings of Hope, Inc.*, which found the wreckage of the crashed airliner in the jungle.

To Bob Weninger, who piloted the *Wings of Hope* airplane in that fateful search mission, the shrine is a symbol of twelve grueling, anxiety-ridden days of a Christmas season not easily forgotten. It is also a reminder of the importance of a small, single-engine aircraft in remote jungle country.

### Aircraft Disappears

On Christmas eve, 1971, a scheduled Lima-Pucallpa-Iquitos flight of a LANSA *Electra*, with 92 persons aboard, was reported missing in the vicinity of Pucallpa, following a violent thunderstorm.

Bob Weninger learned of the *Electra's* disappearance on Christmas day while engaged in one of his normal mercy flights. Because of the demand for his time, December 25 was not a holiday for him; weather the day before had made flying impossible even for a veteran bush pilot, and there were urgent missions waiting, so at a time when people all over the world were sitting down with family and friends for a festive Christmas meal, Weninger was winging over the Peruvian jungles in the Cessna 205.

As he dropped off some much-needed medicine at a small jungle village airstrip and learned about the missing airliner, he immediately radioed the Pucallpa airport to offer his services in the search. Other planes, small and large, converged on the area to help. These included a Peruvian A.F. C-47, and later a U.S.A.F. *Hercules*, and an *Islander* flown by noted American aviatrix Jerrie Cobb.

As Weninger joined the others in circling the dense jungles around Pucallpa for the next four days his mood fluctuated. He remembered a C-47 which had been found in Brazil after three weeks down in the jungle with seven survivors, but he also knew that if the *Electra* had crashed in the mountains the impact and cold nights would make survival after prolonged exposure unlikely.

Weninger was spurred on in his search efforts by the fact that he knew personally some of those missing on the *Electra*. The LANSA copilot was his friend, Jerry Villegas, who, although not scheduled for the flight, had agreed at the last minute to substitute for another pilot. Villegas' wife and two-year-old son were among those who waited anxiously for word of the missing plane.

Rumors of where the *Electra's* engines had last been heard were numerous, but there were no really solid clues to go on, so after four days of searching the Pucallpa area Weninger decided to return to Satipo and his neglected mercy flights. He felt that he could combine his regular work with the search, since the airliner was scheduled to pass over many of his regular ports of call.

Hope faded as ten days dragged by with no word or sign of the LANSA airliner, but on January 4th Weninger's little red and white Cessna landed at Pucallpa to find great excitement in the town. There were reports that a survivor of the aircraft crash, a girl, had been found by woodcutters near Tournevista, a small village only a few miles from Pucallpa as the crow flies but many times that distance by river. The 17-year-old German girl, Juliane Koepke, had made her way alone through the jungle for nine days by walking, stumbling, crawling, swimming, and finally floating down the river on a crude handmade raft. After she had been found, semiconscious and half-starved, it had taken the woodsmen two more days by boat to get her to the town and medical aid.

Juliane remembered little of the crash except flying through space after seeing a fiery engine, later regaining consciousness and starting for help, pausing only to pick up a Christmas cake she had been taking to her father in Pucallpa. The girl had been trained in jungle survival by her parents, noted ornithologists, and with her mother (now missing) was returning to their home in Pucallpa after Juliane's graduation in Lima.

Weninger immediately took off for Tournevista in the Cessna, as did Jerrie Cobb, who was to fly the exhausted girl to Pucallpa and her waiting father.

The aerial search was intensified, spurred on by Juliane's report that several other passengers had survived the crash. Weninger delayed his takeoff in order to talk to the Peruvians who had found the girl. In spite of their great fear of airplanes, he persuaded them to fly with him in his search and point out the location of their camp. They told him the girl had walked about a kilometer a day, then followed a spring and the river.

Once airborne, Weninger backtracked over what he felt the path of the girl had been radioing his course to other search planes. As the larger military aircraft followed the river from a higher altitude, the Cessna barely skimmed the treetops. Suddenly a flash of metal caught Weninger's eye; he circled frantically to find it again, a crumpled piece of fuselage lodged in limbs high above the ground, almost completely concealed by the 130-foot treetops. Weninger announced his find over the radio, and the pilot of the *Hercules*, circling above, radioed back, "How the hell did you ever find it? We can't see anything."

There was no sign of life.

After directing the other planes and ground parties to the wreckage Weninger flew sadly back to Satipo. After landing he made a simple entry in his flight log:

*"January 5, Puerto Inca LOCAL (Search and Rescue, LANSA) Tournavista, Pucallpa."*

That he had found the long-sought airliner was not mentioned. It was all in a day's work for mercy pilot Robert Weninger and his *Wings of Hope* airplane.

Bob Weninger is only one of many humanitarian pilots flying small aircraft in remote and rugged corners of the globe. Weninger's plane, a 1963 Cessna 205 *Skywagon*, was supplied and supported by *Wings of Hope, Inc.*, an American-based, aviation-oriented charity whose primary purpose is to relieve human misery with the aid of small aircraft.

Headquartered in St. Louis, *Wings of Hope* is staffed primarily by non-paid volunteers, mostly businessmen. More than 90 per cent of all donated funds go to the purchase and support of airplanes (the "fleet" now numbers about 20 aircraft, based in South and Central America, New Guinea and Africa). Within the limit of available funds, the organization offers its services to any legitimate humanitarian enterprise regardless of affiliation. No one can hire or charter *Wings of Hope* aircraft. Every service is gratis and no government involvement is sought, but wherever these planes operate they bring friendship to America and appreciation for general aviation.

The Amazon River is a frequent landing field for Peru-based Wings of Hope floatplanes. Many lives have been saved by mercy flights to remote villages where the only other transportation is a dugout canoe or mule cart. Above—map on the flower-filled shrine at Pucallpa pinpoints the spot where Bob Weninger and his jungle-hopper found the wreckage of the LANSA Electra.

This unusual organization began in St. Louis in 1964 when a group of professionals and businessmen first became aware of the tremendous need of a small group of Irish medical missionaries based in an almost inaccessible area in Kenya, East Africa. Earlier the mission had been given a *Super Cub*, which was flown by one of the nuns, but it was frequently inoperable because the hyenas insisted on eating the fabric covering during the night. In 1965 long-distance pilot Max Conrad delivered the first metal airplane, a donated Cessna *Skywagon*, to Kenya.

Later the St. Louis group expanded and incorporated as *Wings of Hope*. Affiliates were formed in other countries, and planes purchased for other locations. Individuals and corporations occasionally contribute surplus aircraft and parts which are either repaired for use or sold to buy other planes or parts. From remote corners of the earth come dramatic reports of lives being saved, suffering eased:

*A Peruvian Indian bitten by a deadly bushmaster snake is flown to a well-staffed hospital; the hour's flight would have taken many days by boat.*

*A woman near death from childbirth complications is flown from the mountains of New Guinea to a seashore village hospital and her life is saved.*

*A critically burned boy in Kenya is transported to modern medical facilities.*

*New Guinea villagers are trained in health education by a missionary group flown in regularly.*

*Medical missionaries compress what once was a year's grueling jungle travel into two or three weeks of life-saving itinerant treatment.*

Because this type of flying is done under the most demanding of circumstances, special training and precautions are needed in aircraft maintenance and flight operations. Putting the right people in the right airplane for the job at hand is not easy. Missionary flying over isolated jungles has no room for improperly trained, undisciplined pilots, regardless of their deep religious or humanitarian dedication. Pilots are not accepted by *Wings of Hope* unless they have wide experience, preferably in the bush, and are also airplane mechanics; and they are given specialized training in the field.

*Wings of Hope* field director in South America is Padre Guy Gervais, a French Canadian pilot and paramedic as well as priest and A & P mechanic. "Padre Guy" flew for six years in New Guinea before going to Peru, and while he was learning to fly he also took time to learn to pull teeth—a talent which comes in handy in back jungle areas where the natives never see a doctor or dentist and tooth decay is rampant. He has flown some 9,000 hours in 12 years in the jungle without serious incident, and now in addition to the flights he makes in the float-equipped Cessna he also gives other pilots specialized jungle flight training.

## Floating "Airports"

Since in many jungle areas "the river is our airfield," pilots get training in float plane takeoffs and landings and in river pilotage. A current of 15 miles an hour in a twisting, snake-infested river over-hung with dense foliage makes taxiing and mooring tricky. Before he stops the engine, the pilot must have mooring line in hand, ready to step down, hook the floats and jump on the bank in almost a single motion. Padre Guy's efforts to teach natives to help has met with limited success: many are afraid to get close to the airplane. Occasionally planes end up tangled in the thick tree limbs, or beached on a rocky shore.

Fuel and oil must be carefully watched for correct type, and for cleanliness. Both are stored in 50-gallon drums and the pilot must personally oversee servicing every time; over-eager helpers could easily pour oil in the gas tanks and vice versa. Fuel is strained through a chamois and checked for color and grade; oil is inspected to be sure it has not been confused with diesel fuel or non-engine lubricants.

Bush pilots learn and respect the runways they must use. Padre Guy has made thousands of landings without incident on runways less than 1,000 feet long, more or less level. Some airstrips double as cow pastures, and at night errant cattle are apt to lick the paint off airplanes, scratch their backs on the elevators, or file their horns on the prop and fuselage. The jungle preflight inspection has to be unusually thorough.

Humidity is the great enemy of the airplane in the jungle. Operators have to be constantly on guard against corrosion, against mildew, against moisture in the fuel and in the air. Rainstorms are frequent but usually of brief duration; the pilot learns to set down on the nearest stream, wait them out, and continue on his way. VFR is the order of the day; there are virtually no NAVAIDS, only scattered radio ground stations, and no repair stations. The pilot with mechanical trouble makes his own repairs on the spot, or he has a long wait for parts or transport. To qualify in a "jungle-hopper" you have to acquire an independence of action virtually unknown to most pilots of today. Your airplane may be inscribed with *Wings of Hope*, but if you wish to fly safely in the tropical bush you had better assume, like Padre Guy, that Providence is on the side of the cautious and the competent. ■

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*(As of December 1, 1972)*

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* Changes to individual airspace designations and airways descriptions, individual restricted areas and individual jet route descriptions are not included in the basic Parts 71, 73 and 75, respectively, because of their length and complexity. Such changes are published in the Federal Register and are included on appropriate aeronautical charts.

** Due to the complexity, length, and frequency of issuance, airworthiness directives, enroute IFR altitudes and standard instrument approach procedures are published in the Federal Register and are not included in basic Parts 39, 95 and 97. In addition, enroute IFR altitudes and instrument approach procedures are depicted on aeronautical charts.

Standard instrument approach procedures are published in the Federal Register by reference to FAA documents which are available for examination at the Rules Docket (GC-24) and the National Flight Data Center, in FAA Headquarters, Washington, D. C. and at FAA Regional offices and Flight Inspection District Offices.

# A Long Walk to St. Louis

Aircraft fuel tanks, like Noah's menagerie, usually come in pairs: mains, auxiliaries, and tiptanks. On most aircraft the latter two are optional. Tips, of course, are hard to overlook, but auxiliaries, being inside the wing, are another matter. They can easily be missed in preflight by the small plane pilot who has never known anything but mains. His education on this subject can progress very rapidly if his ignorance leads to power failure over rough country, as in the following incident:

The problem began when MacPherson, the sales manager, committed himself to demonstrating the *Meyers* 200 to a prospect in Pittsburg, Kans., at noon. It was nearly ten in the morning when he completed the call, but in the speedy *Meyers* it was no more than 90 minutes from St. Louis, so it did not appear that he was cutting it too fine.

But when he called over to the line office and asked them to gas up the airplane right away, he was told that the truck was busy with two big twins, and it might be half an hour before they could top him off. *Not so good.*

He did some rapid calculation in his head. The Meyers held 80 gallons altogether, 40 inboard and 40 out. He had topped the mains yesterday morning, but had taken up two customers during the day, maybe an hour and 30 minutes flying altogether, and it burned about 15 gallons per hour; he had flown off the mains, so they should have about 10-12 gallons left. He kept the auxiliaries half full, another 20 gallons; he could burn them off en route and fill the mains in Pittsburg. *No problem* (he thought).

After checking the weather the sales manager bumped into a young pilot who was building time toward an instrument rating.

"Where you headed, Mac?"

"Over to Pitt. Be back this afternoon. Got a prospect for the *Meyers*."

"Want some company? I need some hood time."

"Sure. You'll have to get it on the way back, though. I'm due in at 12:00 noon."

"Let's go!"

As they started out the door the sales manager heard himself being paged for a phone call.

"Shall I preflight her for you, Mac?"

The sales manager nodded, hardly hearing, his eyes on the big clock on the sales office wall. He found himself half-hoping the call meant a cancellation from Pittsburg.

It turned out to be from his wife, reminding him that they were out of dogfood. It was a quarter after ten when he got to the plane. His young friend was wiping gasoline from his hands.

"All set, Mac."

"You use the checklist?"

"You bet."

"All right, let's wind her up."

They were off at 10:25 and MacPherson laid a direct course southwestward for Pittsburg, ignoring the VOR doglegs. The weather was great, clear as a bell. Within an hour he was over Pommes de Terre Reservoir, truing 200 m.p.h. As he scanned the panel his eyes came back to the main gauges, where the needles were flickering toward EMPTY.

"Better save something for landing," he said, and switched over to right auxiliary. Almost immediately the engine began to cough and sputter. "Something in the line," he muttered, and switched over to the left aux tank. The engine gasped, choked and finally quit.

"Mac, I can't swim!"

"Sit still."

He switched back to the left main and went through his restart procedure . . . *throttle retarded, mixture full rich, fuel pump on* . . . the windmilling prop cranked the big 285 h.p. engine, and after sputtering for a moment it roared back to life.

They had dropped down to 2,600 feet, but he decided against using up his dwindling fuel to climb back up. A quick glance at the chart and he headed south for Buffalo, 20 miles away. Engine leaned, he switched cautiously from one main to the other as the needles flopped listlessly against the peg. His companion did not appear to be breathing, until the runway came into view. Rolling out, MacPherson asked the inevitable question:

"Want to bet there's water in the tanks? What kind of checklist did you use?"

"My own. I always carry it with me."

"Does it say anything about aux's?"

"Oxes? On an airplane?"

"Aux tanks—auxiliary tanks, not oxes!"

His young companion looked over his checklist carefully and shook his head. "No, it's not listed on my airplane."

"How'd you like to buy this one?"

"I don't think so."

"How'd you like to walk back to St. Louis?" ■

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# READING BETWEEN the LINES

## An ability to interpolate is the key to successful use of performance charts

Aircraft performance charts can be of great value to a pilot. By making habitual use of the charts to plot different conditions you encounter or anticipate encountering, you can develop a solid mental image of the operating characteristics and limits of your airplane and its equipment.

Unfortunately, there are many pilots who are not sharp in the matter of interpreting performance charts. Although this knowledge is fundamental to safe and efficient flying, the FAA Aeronautical Center at Oklahoma City has noted a marked weakness in this area among applicants for the Instrument Pilot Written Test. The major problem appears to be *interpolation*, which in aviation parlance is the computation of an intermediate value between two or more stated values. For example, your aircraft manual may tell you how many feet of runway you will need to take off with a full fuel load and also with the mains filled only: but how many feet will you need with tanks filled to two-thirds capacity? Interpolation will tell you. For these contemplating the instrument examination, or for those who took it long ago and have become a little rusty on interpolation, here is a thumbnail refresher course.

There are two basic types of aircraft performance charts: *tables*, in which conditions and performance values are arranged sequentially in columns and rows; and *graphs*, pictorial views of the relationships between two or more variable conditions. In either case, values are listed in major increments, such as 10, 20, 30 or 1,000, 2,000, etc. To get specific answers, it is necessary to interpolate.

Before starting the computation, take a good look at the table or graph, study the labels of the columns, rows or lines—and a performance chart that may at first glance appear complex and confusing will suddenly become clear. Be particularly careful to check the scales, because the chart may be calibrated in knots when you are thinking in terms of mph, or Centigrade instead of Fahrenheit.

Take a practical problem involving a relatively simple table (see Figure 1). You are at an airport where the pressure altitude is 3,000 feet, there is a 10 mph headwind and outside air temperature is 65 degrees F. You are flying a light twin and you want to find the exact take-off distance under this set of conditions.

In the performance table (Figure 1), there are columns for different temperatures scaled in 25-degree increments. Thus, there is no column for 65 degrees F. You must create a column for 65 degrees.

To do so, you start with the nearest *lower* column figure, which is 50 degrees; this serves as a base line. Next you take the interval between the base line and the next column in sequence (75 degrees). The interval is, of course, 25 degrees. The interval between the base line and the required *new* column of 65 degrees is 15 degrees. Thus, the imaginary column will be 15/25ths of the interval between 50 and 75 degrees; this reduces to 3/5ths or 60 percent. That is the essence of any interpolation—finding a percentage of the difference between two listed values.

The remaining steps are:

1. Run a line, drawn or imaginary, across the table from the 10 mph wind velocity to intersect the 50 and 75 degree columns.

2. Circle the figure shown in each column—2030 for 50 degrees and 2242 for 75 degrees—which, as the table heading indicates, represent take-off distances in feet

**TAKE-OFF DISTANCES - FEET**
**(Over a 50 Foot Obstacle)**

Use take-off power on both engines (limiting manifold pressure, 3400 RPM) with mixture in auto-rich position, cowl flaps full open, flaps set at 1/4 (10°). Attain full engine power before releasing brakes. Climb out at 106 MPH (92 knots) CAS. Limit power setting to 2 minutes.

**TAKE-OFF GROSS WEIGHT - 8,000 POUNDS**

| Pressure Altitude Feet | Wind Velocity MPH | OUTSIDE AIR TEMPERATURE - °F | | | | | |
|---|---|---|---|---|---|---|---|
| | | -25 | 0 | 25 | 50 | 75 | 100 |
| 3000 | -10 | 2053 | 2282 | 2536 | 2808 | 3098 | |
| | 0 | 1758 | 1955 | 2172 | 2406 | 2656 | |
| | +10 | 1481 | 1648 | 1832 | 2030 | 2242 | |
| | +20 | 1225 | 1364 | 1517 | 1684 | 2080 | |
| | +30 | 990 | 1104 | 1230 | 1365 | 1510 | |

$\frac{65°-50°}{75°-50°} = \frac{15}{25}$ or $\frac{3}{5}$

65° is the point 3/5 of the interval between 50° and 75°.

$\frac{3}{5} \times 212 = 127.2$

2242 − 2030 = 212

2030 + 127.2 = 2157.2

2157.2 is the point 3/5 of the interval between 2030 and 2242 feet.

FIGURE 1

over a 50-foot obstacle for your 8,000-pound airplane at these temperatures.

3. Compute the difference in runway distance for 50 and 75 degrees. It works out to 212 feet.

4. Now, since the imaginary 65 degree column lies at a point 60 percent of the interval between the 50 and 75 degree columns, the runway distance for 65 degrees can be found by taking 60 percent of the 212 feet (3, above) and adding it to the base line figure. Sixty percent of the difference is 127.2 feet. Add it to the 2030 base line figure and you come up with a final answer of 2157.2 feet take-off distance.

This, of course, is far greater precision than you normally need. In fact, most airmen could take a quick look at this simple table and make a usable estimate of the take-off distance. However, it is good practice to work all problems out in detail, for experience in dealing with more complex tables and graphs.

Turning to graphs, the principle is the same as earlier illustrated: you find the answer you seek by establishing a percentage between two listed values. The difference is that you can read your answer rather than compute it mathematically. Consider Figure 2.

The practice problem for this graph is to find the density altitude, given this set of conditions: airport elevation 2,545 feet, outside air temperature 70 degrees F., altimeter setting 29.70.

A look at the chart shows that you must first convert airport elevation to pressure altitude. Using the conversion table at the right, you find the figure opposite your altimeter setting. It is plus 205, meaning that you can convert to pressure altitude by adding 205 feet to the airport elevation. Thus, pressure altitude is 2,750 feet.

Continue with the following steps:

1. Locate the grid point (A on graph) opposite the stated temperature of 70 degrees F. Draw line A vertically to the neighborhood of the 3,000-foot pressure altitude line.

2. Next draw line B, which represents the 2,750-foot pressure altitude, parallel to the diagonal pressure altitude lines. You can do this visually in this instance, but to repeat the mathematics, you find a percentage of the interval between the two known values (the 2,000 and 3,000-foot lines). The base line is 2,000; the total interval is 1,000; 2,750 feet is 750 feet above the base line, or 750/1000ths, or three-quarters. Using a fine-scale ruler you find the point three-quarters of the way between the 2,000 and 3,000-foot lines, then draw line B so that it intersects line A.

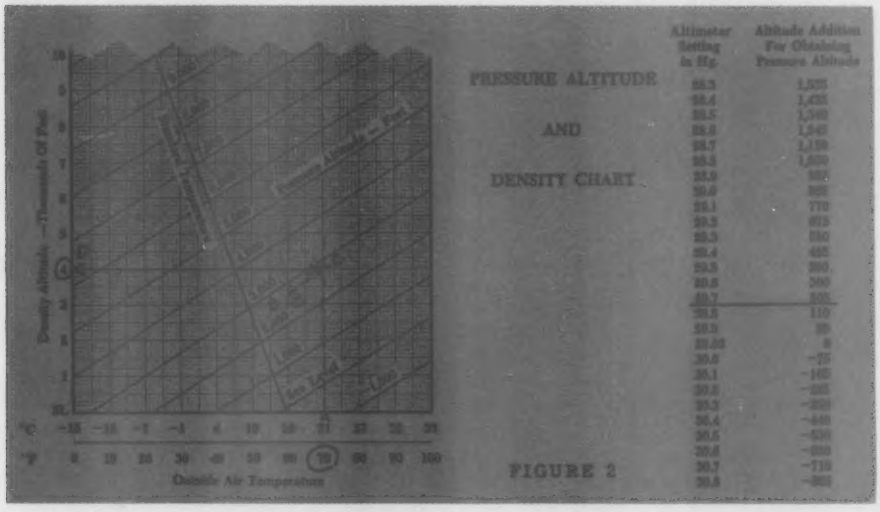


FIGURE 2

3. From the point where the lines intersect (C on graph), extend a line horizontally to the density altitude scale and read your answer (D on graph): 4,000 feet density altitude.

Many graphs are much more complex; they combine a number of functions on one basic grid to do away with the need for several graphs on the same subject. An example is Figure 3, which has three different oxygen cylinder pressure scales. You want to find the **oxygen duration for a crew of three,** at an altitude of 25,000 feet with an oxygen pressure of 1,100 psi.

Using the above facts you can get six different answers to your question, depending upon whether you use a cabin pressurization of 1.0 psi, 0.5 psi, or 0.0 pressurization; and whether you use normal oxygen flow or 100 percent oxygen. Normal flow is represented by the broken lines, starting from the bottom of the graph and eventually curving left, while 100 percent oxygen flow is represented by solid lines emanating from the top of the graph and also curving left.

To work out just one answer, assume that you are flying at 25,000 feet without pressurization and using 100 percent oxygen. (This is example C. Ignore the indications for A, B, D, E, and F on the chart).

The solution process:

1. Using the 1000 psi solid line as a base line (the nearest lower value shown) compute the interval for 1,100 psi (oxygen cylinder pressure) (the percentage process earlier described).

2. Draw a line parallel to the 1,000 and 1,200 psi **solid** lines and halfway between them, because the percentage worked out to 50 percent.

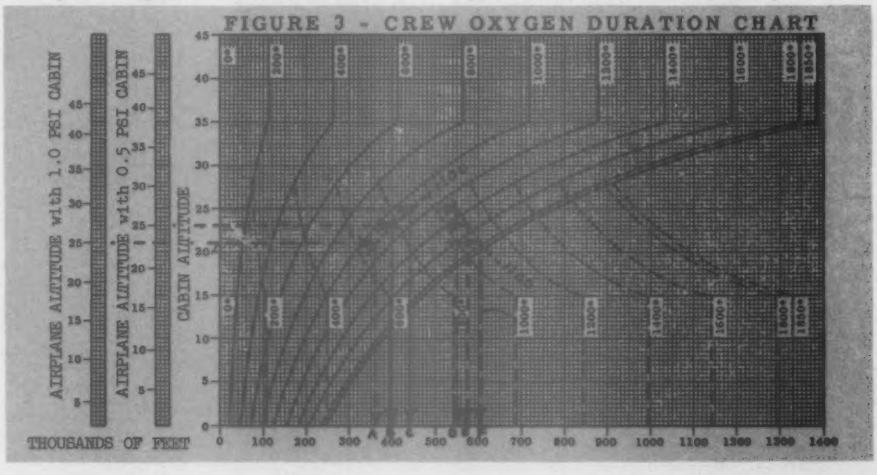
3. Find the point on the cabin altitude scale for 25,000 feet. Draw a horizontal line from that point to intersect your 1,100 psi line.

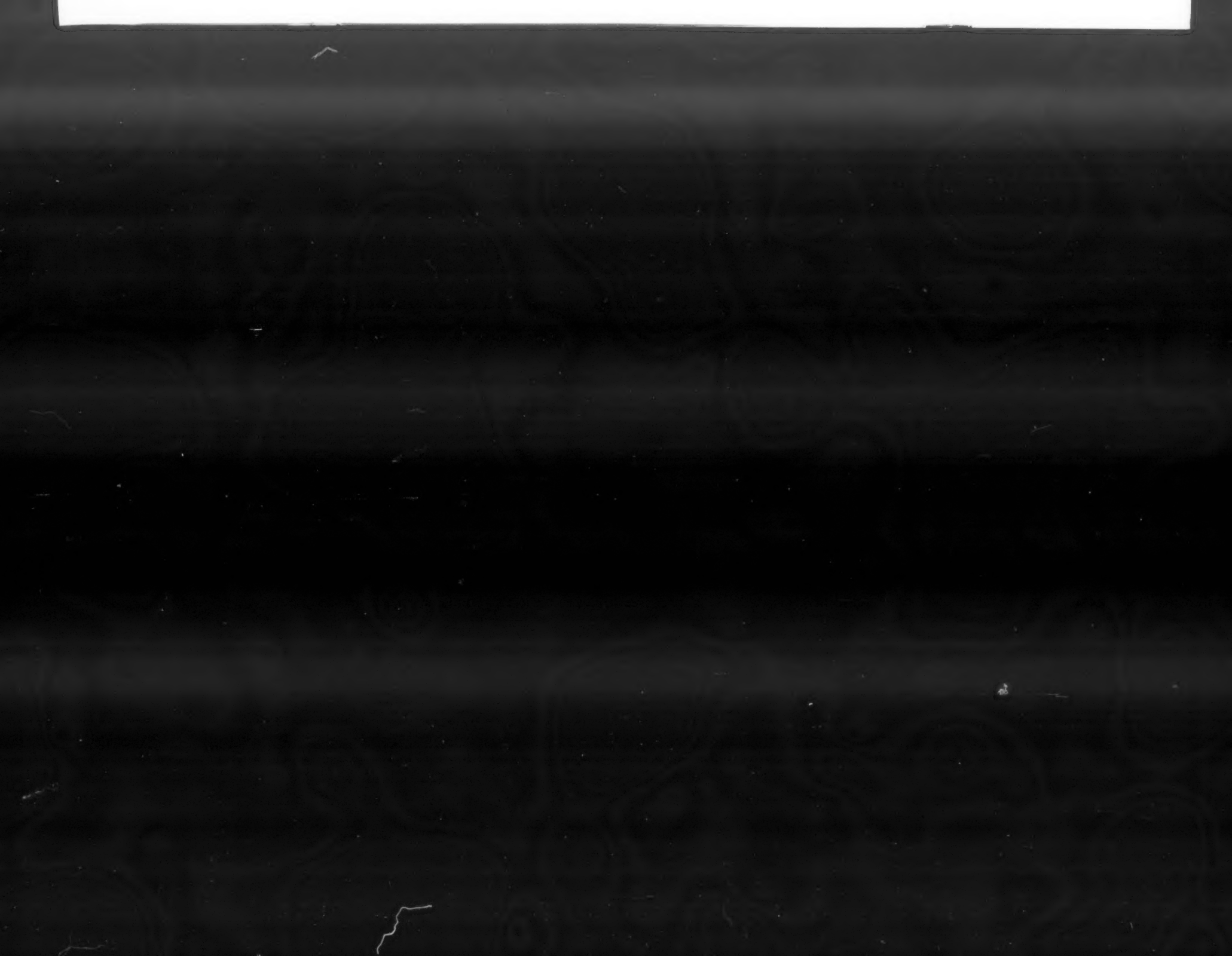
4. The intersection point is the answer; to read it clearly, drop a vertical line down to the scale at the bottom of the graph. By counting the tiny squares in the grid, you find that point C is 4/10ths of the way between 400 and 500, so the answer is 440 minutes oxygen duration.

This is an excellent example of why it is important to check the scale labels carefully. It is 440 minutes for *one* man, but you have a three man crew and must divide accordingly. The final answer is that the oxygen will last 146.7 minutes.

At 25,000 feet you would want to have a precise answer. What was your figure? ■

FIGURE 3 - CREW OXYGEN DURATION CHART





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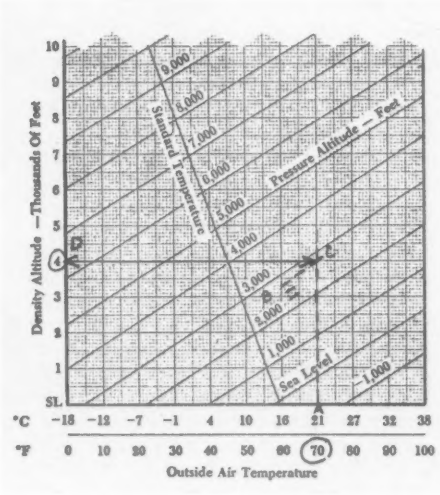


**PRESSURE ALTITUDE AND DENSITY CHART**

| Altimeter Setting in Hg. | Altitude Addition For Obtaining Pressure Altitude |
|---|---|
| 28.3 | 1,535 |
| 28.4 | 1,435 |
| 28.5 | 1,340 |
| 28.6 | 1,245 |
| 28.7 | 1,150 |
| 28.8 | 1,050 |
| 28.9 | 955 |
| 29.0 | 865 |
| 29.1 | 770 |
| 29.2 | 675 |
| 29.3 | 580 |
| 29.4 | 485 |
| 29.5 | 390 |
| 29.6 | 300 |
| 29.7 | 205 |
| 29.8 | 110 |
| 29.9 | 20 |
| 29.92 | 0 |
| 30.0 | -75 |
| 30.1 | -165 |
| 30.2 | -225 |
| 30.3 | -350 |
| 30.4 | -440 |
| 30.5 | -530 |
| 30.6 | -620 |
| 30.7 | -710 |
| 30.8 | -805 |

FIGURE 2

3. From the point where the lines intersect (C on graph), extend a line horizontally to the density altitude scale and read your answer (D on graph): 4,000 feet density altitude.

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Using the above facts you can get six different answers to your question, depending upon whether you use a cabin pressurization of 1.0 psi, 0.5 psi, or 0.0 pressurization; and whether you use normal oxygen flow or 100 percent oxygen. Normal flow is represented by the broken lines, starting from the bottom of the graph and eventually curving left, while 100 percent oxygen flow is represented by solid lines emanating from the top of the graph and also curving left.

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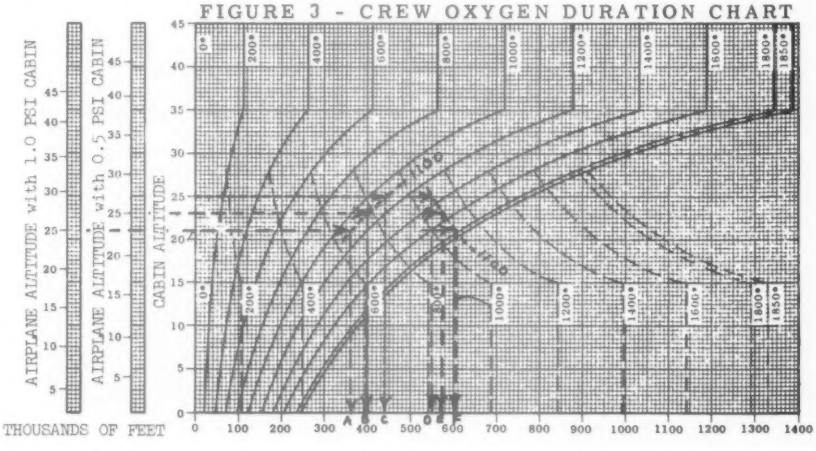

AIRPLANE ALTITUDE with 1.0 PSI CABIN
AIRPLANE ALTITUDE with 0.5 PSI CABIN
CABIN ALTITUDE
THOUSANDS OF FEET
0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400
A B C D E F

# ADAP Comes to Chesterfield County

*". . . Richmond approach control, I'd like a radar vector for Chesterfield County Airport."*

*"Say again the name of the airport?"*

*"Chesterfield."*

*"Sorry, sir, we have no such airport listed."*

*"It's just being built—about 12 miles south of Richmond, on Victor 157."*

*"All right, I can vector you onto the airway. Turn left, heading one six zero. . . ."*

Chesterfield County sounds like tobacco farming country, but as you fly over it you see no large farms, only attractive woodland and gently rolling hills (the county prides itself on being the "nylon capital of the world"). Suddenly you spot a cleared and leveled area and you recognize its configuration as that of Virginia's newest airport, officially scheduled for opening in April 1973.

Chesterfield County Airport is a general aviation airport designed to support local industry and provide relief for congested traffic conditions at Richmond's Byrd Airport. Financed by county funds and Federal matching grants under FAA's Airport Development Aid Program (ADAP), the new airport is expected to improve the quality of life in the county by furthering the growth of the "smokeless industries" on which the present economy is based. The project, one of over 700 already funded under ADAP, is part of FAA's long-range program to help provide better airport facilities for all pilots in the present decade.

The Chesterfield County Board of Supervisers and the Board's executive secretary, Melvin Burnett, have been dreaming and talking about a county airport for more than ten years. But in the early Sixties financial support was not in evidence, and the practicality of their plans was not apparent to all. Richmond's Byrd Airport was only half an hour's drive from the county seat, Chester, and provided air carrier service.

It took Mel Burnett several years to convince a majority of the 91,000 residents of Chesterfield County that modern industries such as they wished to encourage locally had come to depend heavily on corporate aviation as well as on air carrier service, and that local access to an airport virtually at their backdoor would have a great appeal. In the meantime, air carrier operations at Byrd had stepped up to the point where general aviation users were beginning to look elsewhere for a base.

In the late Sixties the county acquired nearly 1,000 acres of undeveloped land, sufficient for both an airport (with clear zone) and an adjacent industrial park. Working closely in their planning with FAA's local Airport District Office superviser, William Whittle, the county received $954,198 from the ADAP fund in 1971, most of it as a 50/50 matching grant. The final environmental statement was approved on August 20, 1971, and construction began on October 7 of that year.

Chesterfield County Airport is now about 85 percent completed. Limited operations may begin in January of next year, with terminal and hangar facilities completed by early Spring. The new airport in its first stage, will have a runway 3,700 feet by 75 feet; a parallel taxiway 40 feet wide, and an operations apron measuring 760 by 320 feet. The field will be enclosed with over 16,000 feet of wire fencing. There will be a Visual Approach Slope Indicator (VASI) and runway end identifier lights (REIL). In subsequent stages the original runway can be expanded to 5,500 feet by 150 feet, and a parallel runway built.

Tom Page, the youthful airport manager, estimates that the present facility will be capable of handling 150,000 operations a year, with tie-down space for over 100 aircraft. Two T-hangars (in addition to the maintenance hangar) will house another 30 aircraft. No landing fees are planned.

The terminal will include a restaurant, and quarters for flight instruction. Instead of engaging a fixed base operator the county will hire qualified mechanics and aircraft service personnel who will be under the jurisdiction of the airport manager. The latest fire-fighting and other safety equipment will be provided.

Chesterfield County airport is a typical fruition of ADAP, now in its third year of operation since the Airport and Airway Development and Revenue Act was signed into law by the President in May of 1970. The purpose of the program is to sponsor a safe and adequate airport construction program throughout this decade by offering grants to local communities, generally on a 50/50 matching basis. Money for the Federal program is derived from user taxes on aviation and aviation products; it is estimated that in the period 1971-81 ADAP will distribute approximately $2.5 *billion*.

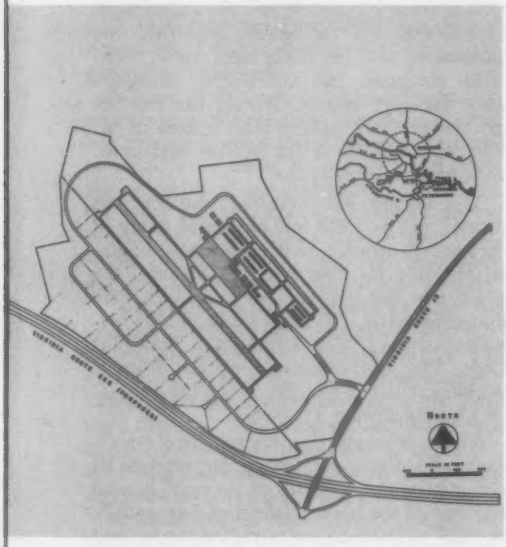
This money can be used for the construction of new airports or the purchase of land

County Executive Secretary Melvin Burnett (left) and Tom Page, Airport Manager, check progress of construction as an early arrival in the background tests runway.

for future airport development; or for a variety of improvements on existing facilities, such as the construction of runways and runway lighting, installation of visual approach slope indicators, removal of obstructions, building of airport access and service roads. For airports serving CAB-certificated air carriers, the safety equipment items required for airport certification, such as firefighting and rescue equipment, public protections, and traffic and wind direction indicators, are eligible for participation under ADAP.

In fiscal year 1972, ADAP sponsored 465 of these airport projects, and committed $286 million of federal funds. Some 270 of these projects were at airports serving both commercial and general aviation; 159 of them were at exclusively general aviation airports; and 36 were at reliever airports (small auxiliary airports which can be used by general aviation pilots in high density terminal areas).

Runway 16-32, with its full length taxiway, takes shape in area flattened out of rolling woodlands. County officials have planned an attractive airpark, in harmony with natural setting and convenient to industry, general aviation.



The program is designed to assist the entire aviation community, both commercial aircraft and general aviation; but the general aviation pilot might well be the largest beneficiary of the program. He will not only benefit from those projects at general aviation airports, but since he also uses so-called "air carrier airports" he will enjoy the advantages of improved facilities at the larger terminals.

The latest tabulation indicates that there are 10,840 airports, 1039 heliports and 369 seaplane bases in the United States, Puerto Rico and the Virgin Islands. Of this total, 4,938 are not open to the general public.

FAA Administrator John H. Shaffer has predicted that 1,000 additional new airports will be required in the United States in the coming decade. The largest need will be for general aviation airports. There are now more than 133,000 general aviation aircraft in the country; that number is expected to increase to 200,000 by the year 1980. FAA estimates that nine out of every ten new airports needed should be facilities exclusively serving general aviation.

The ADAP program is uniquely designed to solve this crisis in airport development, for three reasons. First, it provides a long-range, programmed approach for meeting the safe airport requirements of the aviation community. Secondly, it has the necessary funding to assist local communities in their airport construction. Thirdly, the manner in which ADAP is administered will help overcome objections to new airport construction by working closely with the local community in developing the airport as an integral part of community and by being extremely sensitive to possible environmental problems.

## Users Pay

The funding for ADAP is based on the user tax principle—that is, those who use aviation should bear the majority of the taxes required to improve it. There is a passenger tax of 8 percent on domestic flights, and a $3 departure tax for international flights; a 5 percent tax on air freight; and a tax of 7 cents per gallon on aviation fuel. Excise taxes on tires and tubes are now deposited in the ADAP fund. Finally, there is an annual tax of $25 for all active aircraft. These monies are placed in an Aviation Trust Fund, which is used to support airway and airport development.

Before the grant application can be processed there are four major considerations which must be satisfied:

1. **Displacement of persons.** The local sponsors of the new construction must give assurances that they have complied with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970. These assurances must provide for fair and reasonable relocation payments to persons who might be displaced by the airport project and they must demonstrate the availability of safe and sanitary replacement dwellings.

2. **Public hearings.** When the project involves the location of a new airport, a new runway, or the extension of an existing runway, the local sponsor must offer area residents the opportunity to participate in a public hearing to consider the economic, social, and environmental effects.

3. **Environmental aspect.** The request for an ADAP grant must be accompanied by a draft statement which assesses in detail the impact of the proposed construction on the airport's surrounding environment; the alternative actions considered; and the measures planned by the sponsors to minimized adverse enviromental effects.

4. **State and regional coordination.** The local sponsor must also give notice of his intent to apply for the ADAP grant to the state clearinghouse and regional clearinghouse for federally funded projects. The clearinghouse will coordinate the proposed project with other state and local agencies in order to achieve consistency with area development plans.

The Airport and Airway Development and Revenue Act of 1970 also offers funding to local communities to help with long-range development plans for airports. The Planning Grant Program provides two-thirds of the cost necessary for preparing airport master plans and airport system plans. The information collected during the preparation of such studies is ultimately incorporated in the National Airport System Plan (NASP), published by FAA.

In fiscal year 1972, FAA approved $9,061,104 for funding 181 planning projects in 39 different states. Some 150 of these projects were for the preparation of master plans at individual airports, and 31 were for either state or metropolitan regional airports.

FAA Advisory circulars on the preparation of airport planning studies, "Planning the Metropolitan Airport System" (AC 150/5070-5); and "Airport Master Plans" (AC 150/5070-6), are available from the Superintendent of Documents, GPO, Washington, D.C. 20402. The price is $1.25 each. Further information about Federal aid to airports may be obtained from the FAA Airport District Office in your region. ■

ADAP matching grant helped provide additional general aviation ramp at Manassas, Va. Municipal Airport. Three acre tie-down area bases 50 aircraft, plus fueling facilities.

Famous
**FLYERS**

# WILLIAM BOEING

*A man who thought big.*

Bill Boeing (with pack) and Eddie Hubbard with C-700 they flew from Vancouver, B.C., to Seattle for world's first international air mail flight on March 3, 1919.

William Boeing's interest in aviation was accidental, but his stubborn philosophy that "anything can be done better" led him to create one of the world's great aircraft corporations. Boeing was active for 18 years in the company that bears his name. He contributed greatly to the development of a new industry earning himself an immortal niche in the history of aviation.

Born of wealthy parents in Detroit, on October 1, 1881, William Edward Boeing attended preparatory schools in Switzerland and completed his education at Yale, leaving one year short of graduation in 1930. Boeing's German-born father, who died when Bill was eight, had large holdings in timber and iron ore in the well known Mesabi Range in Minnesota which his son inherited. At Gray's Harbor, a remote and primitive area on the Washington State coast, he learned about timber and cut and sold it for five years.

In 1908 his mechanical bent, which had been evident in various hobbies he pursued as a youth, led him in the direction of aviation. His interest was first aroused by an "International Aeronautical Tournament" held at the old Dominguez Ranch just south of Los Angeles, in January 1910. At a similar air meet held later that year on Long Island, New York, one of the competitors was Glenn Curtiss defending the Gordon Bennett Trophy he had captured in 1909. Observing for the Navy Department was a Cmdr. Conrad Westervelt, a kindred air enthusiast. Later that year Westervelt was sent to Seattle as a naval engineering officer, and there he and Boeing became close friends and later business associates.

In 1915 Boeing attended the Glenn Martin flying school in Los Angeles, graduated, and purchased his own Martin seaplane. Flying back to Puget Sound he miscalculated his approach; the result was a collapsed undercarriage with the two pontoons sheared off. In those days the term "spare parts" was an unknown, and a replacement would take months. The exasperation of a wealthy young man who could buy anything he wished, except a much desired set of pontoons, resulted in his determination to build his own airplane—and a better one.

With 21 workmen, a leased hangar, and unbounded zeal, Boeing and Westervelt built two biplanes, the first of the B & W's. What began as the Pacific Aero Products Company was changed a few months later to the Boeing Airplane Company, after Westervelt was transferred to Washington, D.C. In the formation of the company, Boeing wanted the broadest possible leeway for its future, one that would permit "manufacture of planes, operation of a flying school and . . . [service] as common carrier of passengers and freight." Eighteen years later this charter was to come under severe government criticism and result in a division of the company.

In 1916, with the European conflict already more than two years old, airplanes were becoming extremely important tools of war and Bill Boeing's little factory was churning with activity as the company produced 50 trainers for the U.S. Navy. However, the brief U.S. participation in the war, and the doldrums of the aircraft market immediately after, with only a trickle of Federal funds available for military aviation, resulted in only a handful of dedicated builders (including Donald Douglas and Lawrence Bell) sticking to the trade. For a time, Boeing kept his company alive mainly by producing speedboats and bedroom furniture, and he even considered children's toys. But he did manufacture a few planes to keep his hand in the field.

In 1919 the Post Office Department was flying its own domestic air mail, but could not cross international boundaries. Boeing pioneered the first private international postal service when he flew the mail from Seattle to Vancouver, B.C. on October 15, 1920. This successful venture led eventually to the company's entry into the air mail business in 1927, when Boeing submitted a ridiculously low but successful bid for the Chicago-San Francisco route, newly offered to private contractors.

The severe temperatures along this route ranged from 20° below to 120° above zero; 12,000 feet was the lowest pass over the mountains, and the loads were heavy. Specially designed and constructed airplanes were the only answer. During the first six months of 1927 Boeing built a fleet of 25 transports, known as the 40-As—and never built any more furniture!

The Boeing Air Transport Service was formed and by 1928 had pioneered many of the nation's airways. In his desire to strengthen not only his own position, but also the whole new industry, which had many loosely integrated parts, Bill Boeing effected the formation of the United Aircraft and Transport Corp. The new company included Pratt & Whitney, Chance Vought, Hamilton Propeller Co. and Boeing Transport.

After reviewing this entirely new mushrooming industry and taking into account its rather primitive methods of training, Boeing also started the Boeing School of Aeronautics in 1929 at Oakland, to teach the theory and practice of aircraft and airline operation from the ground up. At the same time he established four $7,500 scholarships open to any American college undergraduate studying aeronautical engineering.

As a continuation of Boeing's foresighted policy, efforts to encourage the study of aero-

In 1927 Boeing provided air service between Chicago and San Francisco in the Model 40-A, powered by a 420 h.p. Wasp engine. The plane carried half a ton of mail and two passengers.

nautics have increased tremendously since these early grants. In 1972 alone the Boeing Company pledged $117,000, and similar commitments for the last ten years are in excess of $1,500,000. Although the school itself is no longer in existence, the education process is going forward more strongly than ever.

Another interesting sidelight on the Boeing initiative was the inauguration in 1930 of air insurance on the Chicago-San Francisco route, with a $5,000 policy for $2 for 24 hours. In the event of an air carrier delay, an additional 24 hours would be allowed "to complete the journey by air, train or stage".

The expansion of Boeing's aeronautical empire came to a halt in 1934. President Roosevelt cancelled all commercial air mail contracts, ordering their takeover by the Army. But with 12 army pilots losing their lives during the first two months of operation, the job was gladly given back to private airlines. That same year, however, a law was passed prohibiting air mail contractors from being connected with any aircraft manufacturer. This meant the split of United Aircraft and Transport Corp. on the grounds of monopoly.

In view of Boeing's consuming interest to encourage and strengthen the industry, this was a harsh blow, leaving him hurt and embittered. As a result he resigned and, with the exception of some consulting and advising work for the Boeing Company during World War II, when the great *Flying Fortresses* and *Superforts* went into mass production, he never returned to the industry.

That same year, 1934, he was awarded the coveted Daniel Guggenheim Medal for "successful pioneering and achievement in aircraft manufacture and air transportation". The citation also stated that "under Mr. Boeing's direction the transport companies became the first to fly passengers at night . . . over long distances and the first to be fully equipped with two-way radios."

William Boeing died in 1956, aged 74, while cruising on Puget Sound. Although he did not live to see the gigantic Boeing 747s darken the sky, his colleagues are certain that, as a man who "thought big", he would have taken great satisfaction in knowing that a plane bearing his name could carry more passengers than any other commercial aircraft. ■

The first Boeing airplane, the B & W, was launched on mahogany pontoons in 1916. Boeing himself made the first flight in the plane, which flew 75 miles per hour on 125 h.p. engine.

■ FUEL WARNING. Reports received at FAA's Aeronautical Center indicate that fuel tank filler neck markings and/or placards are missing or unreadable on many general aviation aircraft. These markings are required for conformation to type design, and also serve to prevent fueling with improper grade.

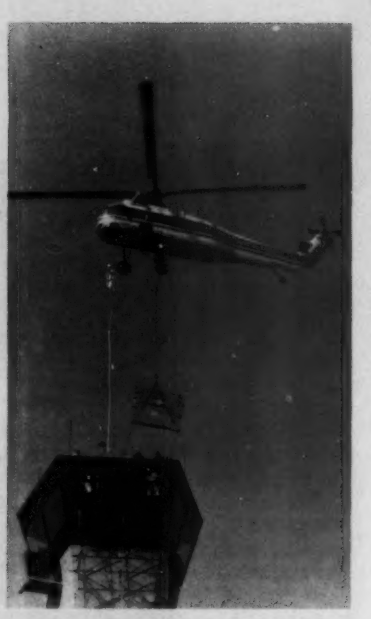
■ SPARE THEIR EARS. VFR pilots are urged to maintain an en route altitude level of at least 2,000 feet whenever possible, and to plan approaches and departures at airports to avoid prolonged low-level flight, in a new FAA advisory circular on "VFR Flight Near Noise Sensitive Areas," (AC-91-36). The circular notes that existing regulations ban flights lower than 1,000 feet above populated areas as a safety measure, but stresses that a higher altitude, weather permitting, would be more desirable over outdoor assemblies of persons, recreational and park areas, churches, hospitals, schools, wildlife areas, etc.

■ FAA FLIGHT ASSISTS numbered 270 during the month of September but few were as dramatic as the incident at Hutchinson, Kansas where a non-flying wife was talked down, in a twin-engine airplane, after her husband collapsed in flight. Controllers at the Combined Station/Tower at Hap Stevens Field calmed the woman and summoned a local pilot, who instructed her via radio in a remarkably good landing. Among the "saves" were 167 lost pilots, 30 low on fuel, 42 involved in weather and 68 with equipment malfunction. Radar was used in 95 cases, and direction finding (DF) equipment in 149.

■ COMMERCIAL PILOT FLIGHT TEST GUIDE (Airplane) has been revised by FAA. This booklet covers both oral quiz and flight maneuvers for the commercial license under Part 61 of FARs. A suggested flight test checklist is included, also prerequisite requirements for pilot and aircraft. Send 30 cents for AC 61.17-1D (Stock #5007-0180) to Superintendent of Documents, GPO, Washington, D.C. 20402.

■ FAA AIRPORTS DIVISION AND DISTRICT OFFICES are listed in a revised Advisory Circular, AC 150/5000-3A. Complete with maps, the publication is designed to aid the public, contractors, sponsors, etc., to locate addresses and telephone numbers of the FAA Airports Service office having jurisdiction over a specific geographical area anywhere in the United States (FAA TAD-484.3, free.)

■ GYROPLANE PILOTS studying for the written test for private or commercial certificates will find FAA's revised written test guide helpful. The booklet outlines knowledge required, lists source material, and includes a sample test with answer and explanations. AC 61-31A is available free from FAA TAD-484.3, Washington, D.C. 20591.



**AERIAL ODD JOBS** of all description are performed by helicopter "handymen." Left—Air Force *Huskie* escorts no-radio replica of 1917 Boeing BW-1 biplane through Washington D.C. terminal control area en route from Dulles Airport to Andrews AFB. The 30-mile trip took 45 minutes. Right—slow and steady is the rule as new control tower window is set in place at Lambert St. Louis control tower. Removing old cracked glass was equally as tricky.

# Logging of Copilot Time Clarified for ATR Candidates

FAA has published a new Advisory Circular clarifying the type and amount of second-in command (copilot) time that a pilot may credit toward the required 1,500 total hours of flight time an applicant for an Airline Transport Pilot certificate must log.

A pilot is permitted to credit *all* copilot time flown in operations conducted under Part 121, or he may credit 50 percent of the time flown as second-in-command in operations other than under Part 121. However, a private pilot is not permitted to credit more than 50 hours under this provision. Most importantly, to be acceptable, *any copilot time* must be acquired in an aircraft where more than one pilot is *required* by the specifications of the aircraft or the operating rules under which the flight is conducted.

Copies of Advisory Circular 61-53 are available free from FAA TAD 484.3, Washington, D.C. 20591.

## Converting Strip Mine to Airstrip

An abandoned coal strip mine site near Hazard, Ky. may be turned into a general aviation airport under a plan being developed with the aid of an FAA planning grant. The proposed Hazard-Perry County Airport could eventually accommodate a 7,000 ft. runway, and would be built on a mountain top leveled by the extensive strip mining of a coal company, which has deeded the property to the community. Hazard is presently served by a small airport in a narrow valley, with one end abutting a mountain.

The Hazard-Perry grant for $10,000 is one of nine projects, involving $361,562, recently approved. A $90,575 grant to the state of Delaware would be used for a statewide airport system plan. Of the remaining seven planning grant recipients, four airports serve both general aviation and airline and three serve only general aviation. The FAA planning grant program pays two-thirds of the cost of approved planning projects.

## Federal Publications Going Up

The Public Printer has advised that rising costs of production and mailing will necessitate a substantial rate increase on all Federal publications, including FAA AVIATION NEWS. One year's subscription to this magazine is expected to go up to about $3.50 in the near future.

New prices for commonly used aviation publications will be published here as soon as the new price list becomes available. Single sale items, such as advisory circulars, will be sold at current prices until present stocks are exhausted.

## User Opinions Help Shape Terminal Control Area for Miami Airports

Proposed configuration of a terminal control area (TCA) for Miami reflects the impact of user opinion, especially in regard to the airspace provided for VFR operations. The Miami TCA would have a ceiling of 7,000 feet and extend to the surface in the control portion surrounding Miami International Airport. A "wing" of airspace under 2,000 feet to the east and west is excluded from the proposed TCA, as is the area below 1,000 feet over Biscayne Bay, which is used for seaplane operations.

TCAs are now in operation at Atlanta, Chicago, Washington National, Los Angeles and New York. The TCA at San Francisco became effective December 11. Another TCA has been proposed for Boston. To operate within a terminal control area a pilot must have an ATC clearance and an aircraft with two-way radio, VOR or TACAN; a transponder and, for takeoff or landing within the TCA, at least a private certificate.

Comments on the proposed Miami TCA (Docket #72-WA-11) should be submitted by January 6, 1973, to FAA, ASO-500, P.O. Box #20636, Atlanta, Ga. 20320.

### FAA ALERT LIST

The following aircraft were listed at press time with the FAA Office of Air Transportation Security as stolen or missing:

| | | | |
|---|---|---|---|
| American AA-1 | N9280L | Cessna 210 | N3884Y |
| Beech-18 | N636CF | Cessna 210 | N5774J |
| Cessna 150 | N4844X | Cessna 337 | N5439S |
| Cessna 150 | N51109 | Mooney Mark 21 | N9247M |
| Cessna 150 | N8080F | Navion NA-1 | N2540T |
| Cessna 150 | N8589J | Piper PA-23 | YVTMTS |
| Cessna 172 | N2412U | Piper PA-24 | N8445P |
| Cessna 172 | N79526 | Piper PA-28 | N5651U |
| Cessna 182 | N3127Q | Piper PA-28 | N6505J |
| Cessna 182 | N5706B | Piper PA-28 | N6542J |
| Cessna 182 | N70646 | Piper PA-28 | N8529N |
| Cessna 182 | N7442Q | Piper PA-32 | N8919N |

If you see any of these aircraft advise the nearest FAA Flight Service Station at once. Of course, any listed plane may since have been recovered by the owner. If your aircraft is stolen, notify the local police and FSS.

## • Military Birds at Civilian Airports

The August issue of FAA AVIATION NEWS tells what happens if a civilian aircraft has to use a military field. (Pay cost of fire or crash equipment used, movement of aircraft, etc.) I wonder—is turnabout fair play? Is the military billed each time a military plane uses a civilian field? Does the military pay part of the costs of salaries, fire equipment, and follow-me truck expenses? I think it is time the military recognized it doesn't own this country. The facilities they use are provided by civilian taxpayer money.

Bernard C. Revoir
Monterey, Calif.

*When the government provides financial assistance in constructing an airport and its facilities there is usually a stipulation that it will be open to military aircraft (with some limitations at the few busiest locations.) At airports without federal funding the military aircraft would be subject to whatever rules and charges are imposed by the airport management. The reasons for not allowing indiscriminate use of military bases by a multitude of private aircraft are dictated by practical necessity.*

## • Half-Blind Flying a Danger

I believe that many typical general aviation accidents could be eliminated if we put an end to the kind of half-blind flying that results from solo piloting a side-by-side airplane. This is especially dangerous if the aircraft is piloted by a student; about 45 percent of his sphere of vision is blocked out by the airframe, according to careful tests I have made. Solo flying should be done from a center-plane seat only, as I am prepared to demonstrate.

For genuine safety, future airplanes should have pusher engines, with pilots sitting well ahead of the leading edge of the wing in a transparent bubble with a transparent instrument display.

Floyd A. Firestone
Dobbs Ferry, N.Y.

*Mr. Firestone has been invited to demonstrate his theories to FAA's Office of Flight Standards.*

## • East Coast Sectional

Does FAA make an East Coast sectional map on one sheet, and if so, where may it be obtained?

Sylvan Mitnich
Philadelphia, Pa.

*There is no one U.S. Government sectional chart that covers the entire eastern coast of the United States, although the eastern half of the two-part VFR planning chart would do so, on a different scale, of course. There is also a low-altitude en route chart, L/27-28, normally used for instrument flying, which covers all the East Coast except the extreme northern and southern parts.*

*A catalog of such aeronautical charts, plus certain related publications, is free for the asking from Distribution Division, C-44, National Ocean Survey, Riverdale, Maryland, 20840. The charts can be ordered by mail from that address or they can be purchased at many airports.*

## • Via North Pole Airlines

If you have a direct line to Santa Claus please ask him what I can give a pilot that has everything. Last Christmas I gave him a new airplane with dual nav-com radios, an ADF and a DME. For Father's Day he got a transponder and for his birthday I gave him an autopilot. Now I'm running out of ideas. He mentioned wanting something called a "flight attendant"—do you know what he means?

Name withheld

*Perhaps he was hinting about a gift subscription to FAA AVIATION NEWS. See inside front cover of this magazine for information on subscribing to the gift that will remind him every month of your thoughtfulness and will keep him informed on flight techniques, aircraft maintenance and all the latest FAA rules and proposed changes. No need to ask Santa—he was our first subscriber.*

## • The Pass/Fail Ratio

I suggest you regularly print a small table showing how many written tests were taken for private, commercial and instrument certificates, how many passed the first attempt, average grades, average number of tries it took, etc.

E. M. Tyler
Chula Vista, Calif.

*Although your suggestion is interesting the FAA Airman Certification Branch believes such a breakdown would be misleading, or even meaningless. The pass/fail ratio is affected by many outside factors. For example, the applicant who, with no preparation, takes the examination primarily in order to preview the questions (for his own study program, or for the benefit of others) dilutes the percentage of first-time success by serious applicants.*

*It is an accepted fact that most applicants who have earnestly prepared themselves by completing a good ground study course (including home study) pass the first time they take a written or oral test; applicants who study casually or not at all nearly always fail the first time. Obviously any ground instructor can evaluate his own success by the percentage of his students who pass tests the first time.*

## • Better Old Than Bold

I have just read "Never Take Anything for Granted" by Robert W. Duncan in your August issue. In 30-odd years of flying I have read many safety articles, but none more to the point than this one. Perhaps if more pilots were like him—admittedly slow to learn and aware of one's limitations—there would be more of us around to share the warmth of a fireplace on a chilly night with loved ones. I hope to see more such articles in the future.

Steve Benz
Overland Park, Kan.

**FAA Aviation News welcomes comments from the aviation community. We will reserve this page for an exchange of views. No anonymous letters will be used, but names will be withheld on request.**

## • Very Short Fuse

In my October issue of FAA AVIATION NEWS, which I did not get until October 31st, I read that a TCA has been proposed for Boston's Logan Airport with comments due on October 30th. I and many other pilots, I'm sure, would like more lead time to respond to rule changes. I personally feel that a TCA for Boston is really unnecessary.

Arthur M. Malinski
Stow, Mass.

*For your future information, if you receive your first word of a proposed rule change after the published deadline for comments, send in your comment as soon as possible, noting the reason why it was late, and it will be considered (within a reasonable period of time)*

*Incidentally, in the case of the proposed Boston TCA, the proposed was published in the Federal Register on September 1, and there were a number of public meetings held in the local area so that opinions could be heard directly from users. In fact, as a direct result of these user views, changes were made to the Boston TCA configuration to provide improved access under the nearby general aviation airports.*

## • Avionic Servicing

I am interested in entering the field of avionic equipment servicing and would like to know about current FAA requirements, licenses, etc. for this sort of career. I am a graduate electronic engineer and an instrument rated pilot.

J. A. Bourgel
Cockeysville, Md.

*FAA issues repairman certificates to perform maintenance on aircraft electronic equipment to employees of FAA-certificated repair stations and employees of air carriers in various specialty fields such as radio and instruments. However, you may work in an FAA-certificated radio repair station without a repairman's certificate provided you do so under the supervision of a certificated repairman. Additionally, a properly qualified, licensed airframe mechanic may perform radio maintenance. Your nearest FAA General Aviation District Office can acquaint you with the specifics of the Federal Aviation Regulations, and direct you to FAA-approved repair stations in your area.*

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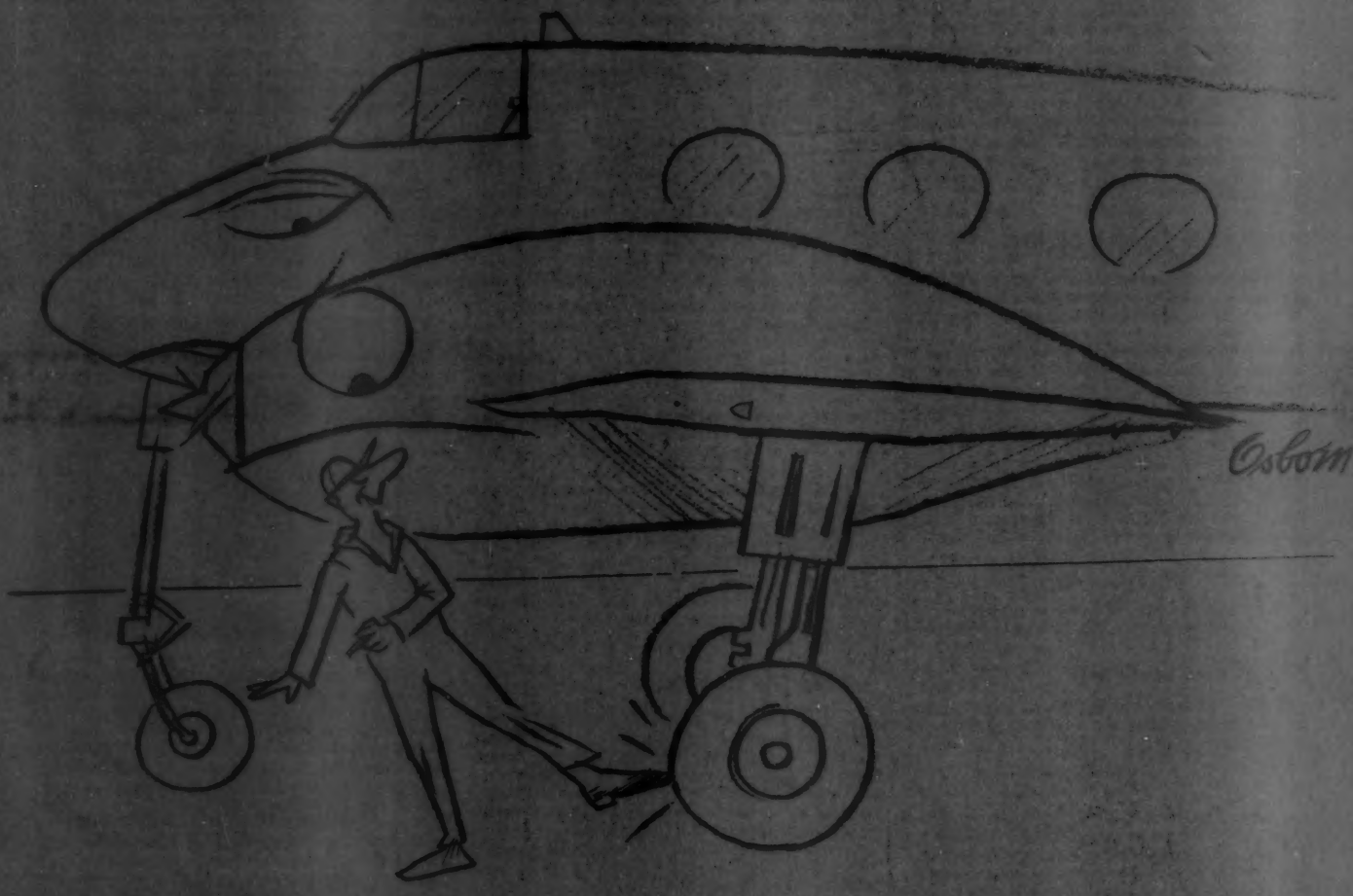
Pilots who preflight with a nonchalant air




Often end up under medical care